

Science: 4th Grade Quarterly Pacing Guide

Quarter 1	Quarter 2
<ul style="list-style-type: none"> • 4.1 Energy and Speed: Use evidence to explain the relationship of the speed of an object to the energy of that object. • 4.2a Production of Heat: Plan and carry out investigations that explain transference of energy from place to place by sound, light, heat, and electric currents. <ul style="list-style-type: none"> a. Provide evidence that heat can be produced in many ways (e.g., rubbing hands together, burning leaves) and can move from one object to another by conduction. • 4.2b Energy: Plan and carry out investigations that explain transference of energy from place to place by sound, light, heat, and electric currents. <ul style="list-style-type: none"> b. Demonstrate that different objects can absorb, reflect, and/or conduct energy. • 4.2c Electric Circuits: Plan and carry out investigations that explain transference of energy from place to place by sound, light, heat, and electric currents. <ul style="list-style-type: none"> c. Demonstrate that electric circuits require a complete loop through which an electric current can pass. • 4.3 Energy and Collision: Investigate to determine changes in energy resulting from increases or decreases in speed that occur when objects collide. • 4.4 Energy Transformations: Design, construct, and test a device that changes energy from one form to another (e.g., electric circuits converting electrical energy into motion, light, or sound energy; a passive solar heater converting light energy into heat energy).* Start in quarter 1-finish in quarter 2 	<ul style="list-style-type: none"> • 4.4 Energy Transformations: Design, construct, and test a device that changes energy from one form to another (e.g., electric circuits converting electrical energy into motion, light, or sound energy; a passive solar heater converting light energy into heat energy).* • 4.5 Renewable and Non-Renewable Resourced: Compile information to describe how the use of energy derived from natural renewable and nonrenewable resources affects the environment (e.g., constructing dams to harness energy from water, a renewable resource, while causing a loss of animal habitats; burning of fossil fuels, a nonrenewable resource, while causing an increase in air pollution; installing solar panels to harness energy from the sun, a renewable resource, while requiring specialized materials that necessitate mining). • 4.6 Wavelength and Amplitude: Develop a model of waves to describe patterns in terms of amplitude and wavelength, and including that waves can cause objects to move. • 4.7 Information and Technologies: Develop and use models to show multiple solutions in which patterns are used to transfer information (e.g., using a grid of 1s and 0s representing black and white to send information about a picture, using drums to send coded information through sound waves, using Morse code to send a message).* • 4.8 Light Reflection: Construct a model to explain that an object can be seen when light reflected from its surface enters the eyes.
Quarter 3	Quarter 4

- **4.12 Rock Patterns:** Construct explanations by citing evidence found in patterns of rock formations and fossils in rock layers that Earth changes over time through both slow and rapid processes (e.g., rock layers containing shell fossils appearing above rock layers containing plant fossils and no shells indicating a change from land to water over time, a canyon with different rock layers in the walls and a river in the bottom indicating that over time a river cut through the rock).
- **4.13 Soil Properties and Plant Survival:** Plan and carry out investigations to examine properties of soils and soil types (e.g., color, texture, capacity to retain water, ability to support growth of plants).
- **4.14 Constructive and Destructive Forces:** Explore information to support the claim that landforms are the result of a combination of constructive forces, including crustal deformation, volcanic eruptions, and sediment deposition as well as a result of destructive forces, including erosion and weathering.
- **4.15 Changing Land:** Analyze and interpret data (e.g., angle of slope in downhill movement of water, volume of water flow, cycles of freezing and thawing of water, cycles of heating and cooling of water, speed of wind, relative rate of soil deposition, amount of vegetation) to determine effects of weathering and rate of erosion by water, ice, wind, and vegetation using one single form of weathering or erosion at a time.
- **4.16 Plate Tectonics:** Describe patterns of Earth's features on land and in the ocean using data from maps (e.g., topographic maps of Earth's land and ocean floor; maps of locations of mountains, continental boundaries, volcanoes, and earthquakes).
- **4.17 Natural Processes:** Formulate and evaluate solutions to limit the effects of natural Earth processes on humans (e.g., designing earthquake, tornado, or hurricane-resistant buildings; improving monitoring of volcanic activity).*

- **4.9 Plant and Animal Parts:** Examine evidence to support an argument that the internal and external structures of plants (e.g., thorns, leaves, stems, roots, colored petals, xylem, phloem) and animals (e.g., heart, stomach, lung, brain, skin) function to support survival, growth, behavior, and reproduction.
- **4.10 Body Systems:** Obtain and communicate information explaining that humans have systems that interact with one another for digestion, respiration, circulation, excretion, movement, control, coordination, and protection from disease.
- **4.11 Sense Receptors:** Investigate different ways animals receive information through the senses, process that information, and respond to it in different ways (e.g., skunks lifting tails and spraying an odor when threatened, dogs moving ears when reacting to sound, snakes coiling or striking when sensing vibrations).